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VOMITING—CLINICAL OBSERVATIONS AND TREATMENT*

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AMONG the indications of a disordered digestion vomiting particularly demands our attention as nurses, because it is not a clinical symptom like the taking of temperature, but a complex indication having great diagnostic importance to the physician and also clinical usefulness in carrying out proper treatment. It may be defined as the symptom common to many disorders, an expulsion of the contents of the stomach either by local or centric irritation.

We will consider first the muscular mechanism of vomiting: a sudden deep inspiration, a subsequent immediate closure of the glottis, and a contraction of the diaphragm. At the same moment the cardiac orifice of the stomach is opened by the contraction of the longitudinal muscular fibres, then follows a violent expiratory contraction of the abdominal muscles and diaphragm by which the contents of the stomach are forced outward. These acts are controlled and regulated by a nerve-centre in the medulla oblongata which is closely related with the respiratory centre. On this account the act of respiration is influenced preceding vomiting; particularly, as seen in children, a temporary increased respiration frequently precedes the act. Impulses are sent out from the vomiting centre to the diaphragm by the phrenic nerves and to the stomach and oesophagus by the pneumogastric, and to the abdominal muscles by the intercostal nerves.

The symptoms are: a disagreeable sensation in the digestive tract; soon nausea with some degree of salivation appears, accompanied by chilliness, a pale countenance, and a feeble pulse, quick and irregular in character. As vomiting is induced the face becomes flushed, the circulation is more vigorous though still weak, and then there is a glow on the surface. After vomiting the patient is very languid, has a disposition to sleep which is interrupted for some time by a slight occasional sickness or retching which is an inefficient act of vomiting, the stomach being partially filled, the skin is cool and moist with more or less perspiration, and the pulse which continues weak is slower and fuller.

* Read before the Nurses' Educational Club of Butler Hospital.

Let us turn our attention to the causes of vomiting. It may be of interest to refer in passing to the views held in times past as to the cause of vomiting, as noted in the text-books of the times. Briefly, up to the days of bacteriology and the scientific study of the excretory functions, vomiting was believed to be due to humors circulating in the blood or phlegms accumulating in the stomach, and treatment was directed to the expulsion of offending products. Even in the early part of the nineteenth century (1820), the giving of emetics was general for all sorts of diseases, even for severe hemorrhages and for disturbances of functions, as in pregnancy.

Causes of vomiting may be centric, due to direct stimulation of the vomiting centre by any toxic or irritating agent in the blood, or it may be a reflex act from disease or stomach irritation. Foreign poisons in the circulation, as an acute alcoholism, the hypodermic use of apomorphia, and the inhalation of chloroform, ether, or sewer gas act upon the vomiting centre. Toxæmic vomiting may also be caused by poisons of non-bacterial origin circulating in the blood, as in anæmia; diabetes, heralding the approach of the diabetic coma; biliousness. Other varieties of centric vomiting are due to bacterial toxins in the circulation, as in the onset of scarlet fever, and with varying frequency in erysipelas, measles, acute pneumonia, malarial fever, and mumps. Vomiting taking place later in such diseases is more apt to be due to uræmia. Toxins from these various forms circulating in the blood flow through the system, reach the vomiting centre in the medulla, and impulses for relief are sent at once to excite the muscles concerned in the act of vomiting.

Reflex vomiting may be due to irritation or emotional disturbance coming from the interior or surface of the brain, also in some forms of nervous trouble. Irritations arise in the cerebrum and are transferred at once to the vomiting centre in the medulla. This act of vomiting is frequently without nausea or epigastric pain. It may be caused by cerebral tumor or abscess and in intercranial hemorrhages or thrombus, particularly hemorrhages. Vomiting is a common and sometimes the first symptom of meningitis. Anæmia of the brain may be responsible for nausea and vomiting; as in the vomiting from the loss of blood, syncope, shock, collapse, also concussion and compression of the brain. Great emotional or sensory disturbances sufficiently irritating to carry impulses to the brain will cause vomiting; such as disgusting sights, tastes, or odor. Vomiting in the case of hysteria may be ascribed to an unusual expulsion of nervous energy affecting the brain centre. In whooping-cough and the irritating cough of tuber-

culosis vomiting may occur. A sudden attack of vomiting, abdominal pain, and in some cases watery diarrhoea, and jaundice, are symptoms during the course of exophthalmic goitre. Severe vomiting is a prominent symptom of acute or subacute gastritis, from putrefying, indigestible, or irritating food, or from overloading the stomach. Vomiting, often blood streaked or "coffee ground," is generally present in gastric cases, and cirrhosis during the middle and latter stages of the disease. Vomiting due to dilation of the stomach may occur several hours after a meal or at intervals of several days, and in this case the amount of vomited material may be very large and contain food which has been eaten many hours previous. Vomiting due to gastric ulcer is apt to occur two hours after eating and is preceded by pain which usually begins immediately after eating and increases in intensity until vomiting takes place, after which pain subsides.

Vomiting is one of the most common symptoms at the onset of appendicitis. In every case of vomiting associated with abdominal pain, the possible existence of hernia ought to be considered.

In disturbances of the liver, kidneys, and in pregnancy, we often note vomiting. Some people will vomit after severe exertion, although the general health may be good. This is due to the peculiar susceptibility of nervous energy.

Nausea is a symptom accompanying vomiting, and usually precedes the act. With nausea we ordinarily have a reflexly active increased flow from the buccal glands, increased respiration, and increased flow of saliva, all of which occur in a flash. In some cases where irritation comes from the brain to the vomiting centre, as in meningitis, and sometimes following ether which is a central irritant, we do not have nausea; the muscles act more quickly, press the stomach walls and expel the contents. When nausea is not present we have what is known as projectile vomiting.

CLINICAL OBSERVATIONS.—Every nurse should have in mind for purposes of record the following essential data concerning the symptom of vomiting, viz.: (a) Has any article, medicinal or dietetic, been ingested which is capable of causing nausea? When was food taken last? What kind of food and its time relation to vomiting? Is it due to medicines given or taken recently? What was the medicine? Has it been recently furnished? (b) Has the previous health been good? Is it an event in chronic diseases or a primary symptom of an acute malady? If there is pain in the abdomen or head, is it relieved by vomiting? (c) Is there fever or evidence of collapse? (d) Is there obstinate constipation or jaundice? (e) What abnormalities are found in the urine and blood?

If there is pain in the abdomen it may be due to some intestinal obstruction, and the development of this symptom depends upon the location of the obstruction. If the pain is in the upper part of the small intestine we have a rapid appearance of vomiting, often of a violent and expulsive nature; whereas with an obstruction in the large intestine, vomiting comes on tardily, following tympanitis. Also one should note any distention of the abdomen, local tenderness, and the various hernias. The urine should be noted: is its odor or color abnormal? is the amount lessened? or has it a sediment? The condition of the circulation should be noted, as vomiting is exhausting. Abnormal temperature accompanied by vomiting often marks the onset of some infectious diseases.

It is an important point in postoperative cases to observe carefully and accurately concerning regurgitation and vomiting, as sometimes a nurse will chart as vomiting that which is only regurgitation. Regurgitation would be the expelling of a certain amount of food without nausea and with only the slightest effort, while vomiting occurring with some contractile effort is usually preceded by nausea. Ante-operative preparation often prevents the appearance of vomiting.

"There is a condition known as acute dilatation of the stomach in which one of the prominent symptoms is vomiting. This vomiting is more in the nature of regurgitation and I think can best be described in the words of some of the patients, as an 'unsatisfactory vomiting.' It is usually accompanied with considerable nausea and also abdominal distention, especially in the epigastric region. The nurse should be constantly on the alert for this condition, as a continuance of it usually leads to death of patient, whereas the recognizing of vomiting of this condition and its association with the epigastric distention should cause the nurse at once to report to the doctor, and early washing out of the stomach usually leads to prompt recovery. This vomiting of acute dilatation of the stomach usually occurs on the second or third day following abdominal operations and continues, as a rule, until remedial agents are employed. It is the constant regurgitation of small amounts from a suddenly dilated stomach, and it is very necessary that the nurse should realize the difference between this type of vomiting and the ordinary postanæsthetic vomiting."

CHARACTER OF THE VOMITUS.—The nurse should note its amount, then the character of the material vomited, including the consistency, odor, and color of the liquid, also the manner in which it is ejected; whether or not there is undigested food in the vomitus, and if so how much, showing the relative time of taking food to vomiting, as the

farther remote from taking food the more complete would digestion be. If vomiting comes from an empty stomach, it is watery and contains considerable mucus, usually indicating gastric catarrh; but if nausea has existed some time previous to vomiting, a watery portion may have been swallowed. The general color of vomitus is amber. The vomiting of small amounts of blood may be from a minute hemorrhage. If the vomited blood is bright red and fluid it has remained but a short time in the stomach, but if it has been in the stomach for a sufficient length of time to be partially digested by the gastric juice it has the appearance of coffee grounds; it may be in the form of clots, reddish or brown, indicating a stay of medium duration. In noting the presence of blood in the vomitus one should make sure that the blood has not been swallowed. This may have been swallowed unconsciously, as in bleeding from the mouth, nose, or pharynx, or it may have been swallowed for the purpose of deception by hysterical patients, or malingerers.

Persistent vomiting may cause a reverse peristalsis of the duodenum, with a consequent passage of bile in the stomach and its appearance in the vomitus. Green vomitus indicates the presence of bile. It is seen after taking anæsthetics and when there is any disorder of the liver. It is not important unless long continued, except in diseases of the liver where it points to some serious obstruction of the bile-duct. Vomiting of grass-green bile, occurring early and sometimes with slight effort with each of the acts of vomiting, is a symptom of diagnostic value in peritonitis, and commonly precedes fecal vomiting in intestinal obstructions.

The appearance of fecal matter in the vomitus is recognized by odor as well as character. It indicates serious obstruction in the intestinal tract and should be reported immediately.

Pus in the vomitus is rather rare. If present it is usually indicative of rupture or abscess of a near-by organ into the stomach, or it may be from some inflammation of the gastric walls. The appearance of parasites in vomitus is very rare.

TREATMENT FOR VOMITING.—Reference has been made to the views held in times past as to the causes of vomiting. It may be of interest to hear somewhat of ancient forms of treatment. Two quotations may be noted from "A Supplement to the New London Dispensary," printed in 1688: (a) prescription for an emetic; (b) prescription for the prevention of vomiting.

(a) "*Acetum vomitorium*. **R** Bark of the roots of *thapsia*, oz. iv; roots of fresh *asarum* dried, oz. ii; *carthamus* seeds hulled, oz. i; sharp cinnamon, oz. fs; mix, bruise and infuse in the sharpest wine vinegar, lb. iii. Digest in a glass well stopped for a month, stirring it often,

then put it into an ordinary still; to which, fix a leaden head, distill in ashes, with a gentle fire, to dryness, so have you distilled vinegar, impregnated with the lead, and very sweet, all of which (not casting away the phlegm) you may keep for use. It is a sweet and gentle vomit, purging all humors, whether hot or cold, without pain. It is given in Quotidians and Tertians, both true and bastard; it takes away weakness of the stomach and loathing, arising from superfluous and sharp humors. Dose from 1 to 3 oz. To delicate persons and ladies you may give it mixed with syrup of vinegar."

(b) "Syrup of mint. *R* Mint, fresh gathered, bruise and beat it well in a marble mortar with so much cinnamon-water as may serve to extract all its juice by expression. This expressed juice in a sufficient quantity, depurate in a warm Balneo; and rejecting all the feces; the pure juice is to be boiled into a perfect syrup, to every pound of which you may add oil of cinnamon, Arcanum of man's blood, of each one dram; but if these be wanting take the inflammable spirit of mint, made of its fermented juice, and perfectly rectified from all its phlegm, four ounces, which adding to the aforesaid perfect syrup; thou hast the simple syrup of mint, of great and admirable virtues. It comforts and strengthens a cold stomach, helps digestion, excites and multiplies the natural heat thereof by its Balsamick property; it cleanses and purifies the blood, strengthens the liver and removes all its vices; it is powerful against vomiting and the continual and frequent use thereof retards old age; for it corrects and amends the faults of all the concoctions. Dose from $\frac{1}{2}$ oz. to 1 oz."

IMMEDIATE CARE OF THE PATIENT DURING AND AFTER THE ACT OF VOMITING.—Give perfect freedom in respiration by removing all respiratory restraint, supporting the patient's head during the act. As soon as vomiting is over, place the patient in a comfortable, relaxed position, always in the horizontal to favor the heart. With a patient coming out of ether, who must never be left alone, one should not rely wholly on turning the head to one side, as this does not favor the glottis in respiration; the body must be in an easy position for the patient to expel contents of the stomach. The position of the tongue in relation to the closure of the glottis is very important so that the vomitus will not get into the larynx. The proper position of the tongue can best be obtained, when the patient is unconscious, by supporting the lower jaw and impinging with the fingers upon the angle of the mandible on both sides with pressure upward and forward. After the act of vomiting, it is the nurse's duty to see that her patient has physical and mental rest and rest particularly for the stomach. It is sometimes necessary to feed by nutritive enemata in order to get this rest.

Ordinarily medicine should not be given unless prescribed. To allay vomiting give perfect rest and restore normal action of the stomach, neutralize the excessive acidity of stomach contents, and allay the irritability of the nervous system. If the reaction of the vomitus is acid, harmless antacids, such as lime water and milk of magnesia, may be given to neutralize the acidity in the stomach. The sipping of hot water or bits of ice will sometimes allay vomiting. Sometimes counter-irritants over the stomach and the epigastric region are very beneficial. Compresses or counterirritants produce a mild irritation of the skin, thereby directly dilating the surface capillaries and indirectly modifying the process of inflammation in parts beneath.

After a nurse has used all permissible means to allay vomiting, prescribed medicines are resorted to. Bismuth subnitrate or cerium oxalate would be prescribed to protect the inflamed mucous surface from irritation. Carbolic acid would be used to allay the irritability of the terminal sensory fibres. Cocaine should be used very little because of the danger of the habit. In vomiting of pregnancy and other forms of excessive emesis it is of great service by depressing the gastric sensory nerves and thereby decreasing the irritability of the stomach.

EMETICS.—When it becomes necessary to empty the stomach completely, as in the case of poisoning, emetics are resorted to. Emetics are divided into two classes—local and systemic. Local emetics act by irritating the end organs of the gastric and œsophageal nerves and by reflex action of the vomiting centre. They include alum, mustard, salt, sulphates of zinc, copper, and mercury, and tepid water in quantity. The action of local emetics does not continue long and is not accompanied by much depression.

The systemic emetics act by direct irritation of the vomiting centre in the medulla, acting through the medium of circulation wherever produced. Apomorphia, derived from the action of hydrochloric acid on morphia, is a systemic emetic; dose by stomach, $\frac{1}{8}$ – $\frac{1}{6}$ gr.; hypodermically, $\frac{1}{16}$ gr. A fresh solution is important. Apomorphia, though depressing to the heart, is the best emetic when swallowing is difficult. Ipecac is another systemic emetic, dose as an emetic, $\frac{1}{8}$ – $\frac{1}{4}$ gr. In the stomach it irritates the mucous membrane and nerve terminations and causes prompt emesis. When absorbed in the blood it excites the vomiting centre in the medulla and produces the same results.

In a case of emergency where a patient has taken an overdose of morphia or other toxic alkaloid, give tepid water in large quantities, a single dose of ipecac or apomorphia, or mustard and water while awaiting medical aid.